

ON THE TRUE IDENTITY OF *Chomatophilus* WITH DESCRIPTION
OF A NEW SPECIES, AND WITH KEY AND CATALOGUE
OF ALL SOGONID GENERA¹

(CHILOPODA : GEOPHILOMORPHA : SOGONIDAE)

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In 1896 when Pocock described *Chomatophilus*, he located it in Geophilidae, whose scope at that time embraced nearly the whole Order Geophilomorpha as we know it today. He stated it to be "near *Himantarium*," which is indeed an apt description of its superficial appearance. Grossly it does rather resemble an himantariid.

Doubtless Pocock's description, figures, and himantariid reference plus the absence in collections of the species and genus have conspired to perplex more careful subsequent authors pertinent to the placement of the genus. Accordingly, in his celebrated monograph of 1929 (Tierreich, Lief. 52, p. 349) Attems could do not more with *Chomatophilus* than situate it in his section of Geophilomorpha of uncertain position (*incertae sedis*). Chamberlin, as we shall see, having forgotten Pocock's orphaned genus, redescribed it as his own *Nuevona* but correctly located it in Sogonidae.

I have studied Pocock's type in the British Museum (Natural History), find it to be a sogonid, and redescribe it here. My composite description is based, then, both upon a typical and many non-typical specimens.

In many years' study of some of the sogonids I have found the generic keys (all Chamberlin's) not to be very useful: indeed, in places they are ambiguous, obscure, exiguous, and downright wrong. Therefore I present here an improved though still not satisfying key; I have not seen specimens of all genera. Because the generic presentations are so dispersed in space and time I have appended an annotated catalogue of them.

What are sogonids? Chamberlin affirmed them to constitute a taxon of suprageneric level coordinate with the established geophilomorph families. I am inclined to believe they are not. For instance—it has never before been suggested—they have much in common with that as yet untitled section of the Geophilidae clustering around *Clinopodes*. But for the time-being in order to facilitate cleaning the sogonids' rather chaotic Augean stables it is useful to assume that they form a bona fide family, even if in fact they do not. I really suspect that

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Bismark's comment on Italy,² that it is a geographical concept, applies equally well to Chamberlin's Sogonidae: they may well be only a geographical concept, limited, as they are, to the northern Neotropics. I feel confident that had the conservative Attems or the more radical Verhoeff found a typical sogonid in, say, Europe, they would have called it a geophilid.

Chomatophilus Pocock

Chomatophilus Pocock, 1896, Biol. Centr. Americani, Chilop., p. 39.

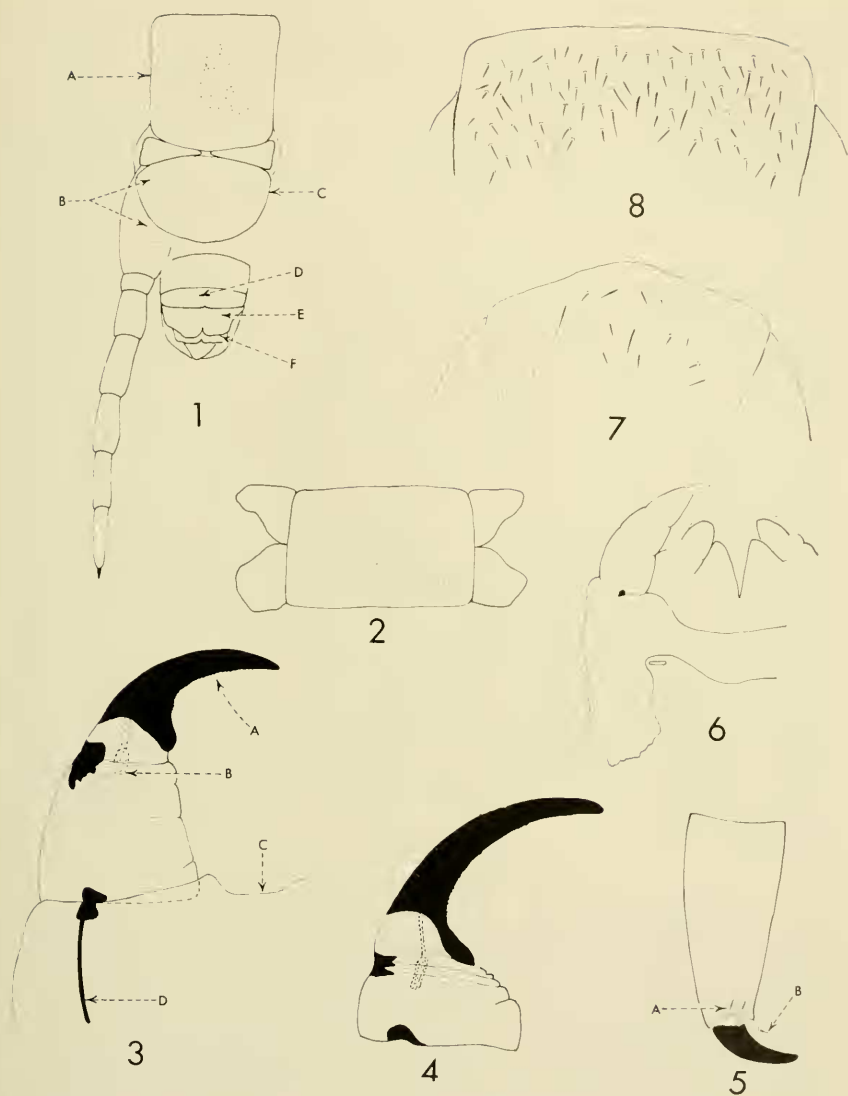
Chomatophilus Pocock: Attems, 1929, Tierreich, Lief. 52, p. 349. (Under *Geophilomorpha incertae sedis.*)

Nuevona Chamberlin, 1941, Pan.-Pac. Ent. 17:185. Type-species: *Chomatophilus smithi* Pocock, 1896. Monobasic. **New synonymy.**

The following characteristics in combination will distinguish this genus from all others. Body somewhat attenuate anteriorly, dorsoventrally somewhat flattened, rather vermiform. Massive transegmental tracheal trunks arise in segment II and pass posteriorly through many segments. Pleuroprosternal sutures wholly absent. Each ventral porefield undivided, centrally extended forward in a broad arc. Pretarsal anterior parungues double. Ultimate sternite exceptionally broad, its lateral and posterior margins together describing a semicircle. Each coxopleuron with two cryptic, heterogeneous gland cavities. Anal pores heterogeneous like the coxopleural cavities.

GENERAL. Length, to 90 mm. Pedal segments, 85-115. **SHAPE.** Rather flattened, vermiform. Attenuate at both ends, more so anteriorly. **COLOR.** Yellowish-orange to whitish-yellow dorsally; ventrally sordid white. **ANTENNAE.** Rather short, slightly flattened dorsoventrally, somewhat attenuate distally. **CEPHALIC PLATE.** Slightly domed dorsally; anteriorly rostrate; varying from about as long as wide to slightly longer than wide. Prebasal plate exposed medially. **CLYPEUS.** Anterocentral fenestra and prelabral plagulae absent. Anterior half sparsely to densely setose. Paraclypeal sutures prominent and complete. **LABRUM.** Tripartite, the sidepieces merging imperceptibly with the midpiece which extends posteriorly. Pigmented teeth absent; sidepieces with long, posteriorly-directed hyaline filaments; midpiece with much shorter but otherwise similar filaments. **MANDIBLE.** Corpus distinctly triangular; shaft very short and twisted. Armature a single row of very short hyaline teeth. **FIRST MAXILLAE.** Coxosternum medially neither diastemate nor sutured; lappets present or absent. Medial lobes triangular, very broad. Telopodite bipartite, with prominent, robust, scabrous lappets. **SECOND MAXILLAE.** Isthmus anteroposteriorly shallow, transversely wide; without diastema or midlongitudinal suture; areolate, not membranous. Pore opening posteromesad. Postmaxillary sclerites and statumina absent. Telopodite: robust, short, inflated; without distomesal denticles; basal article with prominent ventral and dorsal condyles; terminal claw short, straight, without basal bristles, non-pectinate, non-fibrous. **PROSTERNUM.** Greatest width exceeding visible length. Anteriorly with broad, deep diastema; without denticles, or if present, then pale and evanescent. Pleurograms prominent, complete to condyles. Pleuroprosternal sutures entirely absent, not represented

² "Italien ist ein geographischer Begriff."



Figs. 1-3, 5-7, *Chomatophilus aphanistes*, n. sp., holotype: 1, penult, ultimate and postpedal segments, ventral, A = penult sternite, B = coxopleural gland crypts, C = ultimate sternite, D = fused female gonopods, E = anal pore crypts, F = adanal laminae; 2, sixth sternite with flanking subcoxae, ventral, sternal porefield shown, those of subcoxae deleted; 3, right preensor and adjacent prosternum, ventral, A = serrulate ventral edge, B = poison calyx, C = diastema, D = pleurogram; 5, tenth tarsus and pretarsus, anterior surface, A = paired anterior parungues (deflected proximad), B = single posterior parunguis; 6, first and second maxillae, ventral; 7, clypeus. Figs. 4 and 8, *C. smithi* Pocock: 4, right preensor, ventral; 8, clypeus.

posteriorly by fragments. PREHENSORS. Basal articles short and broad, claw relatively long. Flexed, not attaining anterior head margin. Mesal denticles, basal tooth both absent. Ungular ventral edge smooth or irregularly serrulate; unguar dorsal and ventral surfaces not appressed. TRACHEATION. Apart from the usual dorsal oblique connectives with a subdorsal system of trans-segmental trunks running anteroposteriorly. Four thereof arising in segment II passing caudad and joined in Segment VI by four additional, all terminating variously somewhere anterior to body mid-length. PARATERGITES. Absent. LEGS. Short and robust, very sparsely setose. Each pretarsus with two anterior parunguis and one posterior parunguis. STERNITES. All wider than long. Sculpturing coarsely areolate. Setae minute, sparse. *Carpophagus*-structures absent. Those more anterior with very shallow midlongitudinal sulci. Subcoxal porefields present, extensive. Sternital porefields: on one through penult; undivided, each in the form of a transversely wide posterior band with its middle extended anteriorly in a broad arc, the extension on posterior segments much more extensive than on anterior segments. Formed anterolateral porefields absent, represented by irregularly scattered single spores. ULTIMATE PEDAL SEGMENT. Pretergite entire, laterally not fissate. Tergite shieldshaped, narrowed, posteriorly; length about equal to greatest width. Presternite medially divided. Sternite: much wider than long; sides and rear margin together describing a broad semicircle. Coxopleuron: only slightly inflated, relatively short and small, not encroaching upon penult segment; each with two ventral cryptic gland cavities, these heterogeneous, composite, with inclusive canals and lumina irregularly formed by a distinctive papillate membrane, the anterior pit often partly concealed by penult sternite. Telopodite: somewhat longer than penult; articles more or less swollen depending upon sex and species; with two tarsalia; pretarsus distinctly unguiform, basally not filamentous.³ POSTEPEDAL SEGMENTS. Male gonopods widely separated, biarticular. Female gonopods each uniarticular, medially fused without demarcation. Anal pores notably large, each internally composite and heterogeneous with constituent canals and papillate membrane therein like the coxopleural crypts.

Chomatophilus aphanistes, n. sp.

The new species, although indisputably congeneric with *smithi*, is very different from it in many particulars of infrageneric rank. Grossly different from *smithi*, *aphanistes* is shorter and mesopodal; the Pocock form is distinctively polypodal and sizeable. Furthermore in *smithi*: (1) pedal pairs, 81-115. (2) Tarsungular ventral edge is mostly smooth, with shallow, irregular serrulations only proximally. (3) Clypeal setae robust and numerous; present anterolaterally. (4) Porefield of sternite one with posterolateral extensions. (5) Female ultimate legs notably inflated. (6) Second maxillary coxosternal lappets absent. (7) Tarsungular blade far exceeding length of basal articles. In *aphanistes*: (1) pedal pairs, 47-59. (2) Tarsungular ventral edge finely, regularly serrulate over entire length. (3) Clypeal setae delicate, less numerous; absent anterolaterally. (4) Porefield of sternite one strictly subcentral, without posterolateral extensions. (5) Female

³ Compare with *Garrina*, wherein rear leg pretarsi, including the ultimate, although typically unguiform, are basally conspicuously fibrous, which in the *Geophilomorpha* is most uncommon.

ultimate legs at most very slightly inflated. (6) Second maxillary coxosternal lappets present. (7) Tarsungular blade not greatly exceeding length of basal articles. There are additional differences, but the foregoing seem the most useful and obvious.

Holotype: female. Mexico, San Luis Potosi, on route 80 4.3 miles east of Ciudad del Mais at 4,300' elevation. August 10, 1966. G. B. Ball and D. R. Whitehead, legg. Deposited in the U. S. National Museum.

GENERAL. Length, 30 mm. Pedal segments, 57. Body shape, anteriorly and posteriorly slightly attenuate. Color: antennae and dorsum pale yellow; venter sordid white. **ANTENNAE.** Length to head length, 8:3. Filiform, distally attenuate slightly, slightly flattened dorsoventrally. **CEPHALIC PLATE.** Greatest width to length, 9:8. Setae very short and sparse. Frontal suture barely visible as a band of weaker areolation. Prebasal plate slightly exposed medially. **CLYPEUS.** Paraclypeal sutures prominent and complete. Anterocentral fenestra and prelabral plagulae absent. Setae: relatively long and delicate; few in number, forming two groups, a central one of 4 girdled by a setal semicircle; none anterolaterally. **LABRUM.** Sidepieces merging with midpiece. Entire labral margin fringed with hyaline filaments, these very long on sidepieces but notably shorter on midpiece. **FIRST MAXILLAE.** Coxosternum with 15 setae dispersed irregularly in two files. Medial lobes relatively long and wide, their intervening diastema comparatively deep. Coxosternal lappets narrow, pointed, much shorter than telopodite lappets. Telopodites: bipartite, each with a thick scabrous lappet. **SECOND MAXILLAE.** Isthmus comparatively shallow; medially areolate, neither membranous, suturate, nor diastemate. Postmaxillary sclerites absent. Telopodite: prominent dorsal and ventral basal condyles present; relatively short and inflated; without denticles or protuberances; terminal claw short and weak, not exceeding neighboring setae. **PROSTERNUM.** Greatest width exceeding exposed length. Anteromedial diastema broad and relatively deep, denticles absent. Pleurograms prominent, complete to condyles. Pleuroprosternal sutures entirely absent. **PREHENSORS.** Flexed, not attaining anterior head margin. Mesobasally with a very low swelling. Ungular blade ventrally coarsely and irregularly serrulate; ungula not notably recurved, not uncinata. Poison calyx in lower tarsungula; poison gland terminating in trochanteroprefemur. **STERNITES** through penult. Setae short, very sparse. Each with a very shallow midlongitudinal depression. *Carpophagus*-structures absent. Porefields: present on first through penult; on anterior sternites (except first) each a posterior, transverse, uninterrupted band medially extended forward in a low, broad arc; on more posterior sternites the mediocephalad extensions become wide and very long eventually occupying most of the paramedian length of each sternite. **LEGS.** Setae very sparse and minute. Rear legs dorsally not flattened. Pretarsi: each with two anterior and one posterior parungues, essentially equal, minute. **ULTIMATE PEDAL SEGMENT.** Pretergite very wide, not fissate laterally. Tergite greatest length about equal to greatest width. Presternite medially entirely separated by wide membranous area. Sternite: greatest width far exceeding length; sides and posterior margin conspicuously rounded, nearly semicircular. Coxopleuron: comparatively small, slightly inflated, a patch of setae on posteroventral surface, otherwise nearly glabrous; each with two deep cryptic gland cavities,

these of the heterogeneous type with many constituent canals, their lumina lined with a distinctive papillate membrane.⁴ Telopodite: longer than penult; the articles but slightly swollen; the two tarsal articles equal in length and diameter; pretarsus clearly unguiform. POSTPEDAL SEGMENTS. Sparsely setose. Female gonopods uniaarticulate and completely fused medially without demarcation. Anal pores, like coxopleural crypts, internally heterogeneous and lined with convoluted papillate membrane.

Paratypes. There are 37 paratypes representing many localities in four Mexican States. All agree closely with the holotypic description, except that in the males the ultimate legs differ in being much swollen. Pedal segments, 47-59, mode 51. Lengths, 15-30 mm. U. S. National Museum collection.

VERACRUZ. Slope of Vulcan San Martin north of San Andres Tuxtla, July 20-August 1, 1959, Keeton and Valentine. San Andres Mountains, Bastanal, 2500'-3000', September 19, 1965, Ball and Whitehead. Lake Catemaco, Coyame, July 2, 1963, Whitehead. San Andres Mountains, 25 miles west of Contecompan, 100', September 18, 1965, Ball and Whitehead. SAN LUIS POTOSI. 18 miles east of Ciudad del Mais, September 3, 1964, Awram and Whitehead. 24.7 miles east of Landa de Matamoros, 5000', October 18, 1965, Ball and Whitehead. 4.3 miles east of Ciudad del Mais, July 10, 1966, 4300', route 80, Ball and Whitehead. Ciudad del Mais, September 3, 1964, Whitehead. TAMAULIPAS. 8.1 miles west of Encino, 3100', October 11, 1965, Ball and Whitehead Gomez Farias, Aqua Livida, 5800', October 9, 1965, Ball and Whitehead. 8 miles northwest of Gomez Farias, Rancho del Cielo, 3800', August 6, 1965, Ball and Whitehead. OAXACA. 21.8 miles north of Tuchtatengo, July 18, 1966, Ball and Whitehead.

Chomatophilus smithi Pocock

Chomatophilus smithi Pocock, 1896, Biol. Centr. Amer., Chilopoda, p. 39.

Chomatophilus smithi Pocock: Attems, 1929, Tierreich, Lief. 52, p. 349. (As *Geophilomorpha incertae sedis*.)

GENERAL. Length, to 90 mm. Pedal segments, 81-115. Shape, anterior and posteriorly attenuate. Color: antennae and dorsum yellowish-orange; venter sordid white. ANTENNAE. Length to head length ca. 11:4. Filiform, distally slightly attenuate, dorsoventrally slightly flattened. CEPHALIC PLATE. As wide as long to slightly longer than wide. Setae short and sparse. Frontal suture barely visible as a band of weaker areolation. Prebasal plate slightly exposed medially. CLYPEUS. Paraclypeal sutures prominent, wide, complete. Antero-central fenestra and prelabral plagulae absent. Setae: relatively long, notably robust and numerous; only on anterior half of clypeus; present anterolaterally. LABRUM. Sidepieces margin with midpiece without clear demarcation. Entire labral margin fringed with hyaline filaments, those of sidepieces much longer than those of midpiece. FIRST MAXILLAE. Coxosternum with some 30 robust setae, these irregularly disposed. Medial lobes long and very wide, the intervening

⁴ For further discussion of this membrane in sagonids and other taxa see Crabill, 1961, Proc. Ent. Soc. Wash. 63:132.

cleft deep. Coxosternal lappets absent. Telopodites: bipartite, each with a robust scabrous lappet. SECOND MAXILLAE. Isthmus comparatively shallow; medially areolate, not hyaline or suturate or diastemate. Postmaxillary sclerites absent. Telopodite: prominent dorsal and ventral condyles present; relatively short and much inflated; without denticles or protuberances; terminal claw rather long, exceeding neighboring setae. PROSTERNUM. Greatest width exceeding visible length. Anteromedial diastema broad and deep, with low evanescent denticles in most. PREHENSOR. Flexed, not surpassing front of head. Without mesal denticles but tarsungula mesobasally swollen. Ungular blade smooth for most of its length (proximally with a few shallow serrulations). Poison calyx in lower tarsungula. Poison gland terminating in lower trochanteroprefemur. STERNITES through penult. Setae short and very sparse. Each with a very shallow midlongitudinal depression. Porefields: present on first through penult; on anterior sternites (including the first) each a very wide, transverse and uninterrupted band medially extending forward in a prominent arc; on posterior sternites the mediocephalad extension becoming very wide and long, eventually occupying most of the paramedian length of each sternite. LEGS. Setae very sparse, minute. Rear legs dorsally somewhat flattened. Pretarsi: each with two⁵ anterior and one posterior parungues, these essentially equal and minute. ULTIMATE PEDAL SEGMENT. Pretergite wide, laterally not fissate. Tergite greatest width about equal to length. Presternite medially broadly divided. Sternite: greatest width far exceeding length; sides and rear conspicuously rounded, nearly semicircular. Coxopleuron: comparatively small, slightly inflated, with a patch of setae ventroposteriorly; each with two deep cryptic gland cavities, these of the heterogeneous type with numerous constituent canals, their lumina lined with a distinctive papillate membrane. Telopodite: longer than penult; the articles in both sexes notably inflated; distotarsus notably shorter than proximotarsus; pretarsus distinctly unguiform. POSTPEDAL SEGMENTS. Sparsely setose. Female gonopods uniarticular, medially broadly fused without demarcation; male gonopods biarticular, medially widely separated. Anal pores, like coxopleural crypts, internal heterogeneous with inclusive canals and lining papillate membrane.

The holotype in the British Museum (number 1897.3.1.127) has no more precise locality than "Amula" on its ticket. In the original description Pocock places Amula in the State of Guerrero at 6000 to 7000 feet elevation. Several very extensive Mexican gazetteers fail to reveal this place name, but they do give a number of listings for Amole, at least one of which is in Guerrero. It seems possible that Amula is a misspelling of Amole. I have examined the holotype, and in addition specimens collected in the following localities. SAN LUIS POTOSI. 19.3 miles northwest of Tamazunchale on route 85. Near Ciudad del Mais. NUEVO LEON. Chipinque mesa near Monterrey. QUERETARO. Near Pinal de Amoles. TAMAULIPAS. Near Gomez Farias, Racho del Cielo.

⁵ The presence of two anterior parungues, instead of the usual one, is most uncommon in the Geophilomorpha. Elsewhere I have encountered it only in the Schendylidae.

KEY TO SOGONID GENERA

The following key is partly based upon Chamberlin's published descriptions and keys, which portions remain to be verified through direct recourse to specimens. I assume responsibility for the placement and identification of those genera (signaled by asterisks) material of which I have studied. Those familiar with Chamberlin's several sogonid keys (e.g. in Univ. Utah Biol. Series, VII (3):17, 1943) will note that, unlike him, I have not dichotomized the conditions of the ultimate pretarsus, that is, pretarsus a claw versus pretarsus a tubercle, which in my key might have been introduced in the fifth couplet. This is because I have found both conditions to be intragenerically variable within *Garrina* and *Sogona*. In fact, I have seen specimens of both genera wherein in the same specimen one ultimate pretarsus could be called tuberculate, the other unguiform.

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|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| 1a. Ultimate tarsus consisting of one article; ultimate pretarsus absent; each coxopleuron with one crypt | Timpina Chamberlin |
| 1b. Ultimate tarsus consisting of two articles | 2 |
| 2a. Each coxopleuron with one crypt | Gospina Chamberlin |
| 2b. Each coxopleuron with two crypts | 3 |
| 3a. Ventral pores absent; ultimate pretarsus absent | Oligna Chamberlin |
| 3b. Ventral pores present | 4 |
| 4a. Tarsungula with basal tooth | Portoricona Chamberlin* |
| 4b. Tarsungula without basal tooth | 5 |
| 5a. Pleuroprosternal sutures entirely absent; ultimate sternite posteriorly broadly rounded | Chomatophilus Pocock* |
| 5b. Pleuroprosternal sutures present, complete or broadly incomplete; ultimate sternite posteriorly not broadly rounded | 6 |
| 6a. Pleuroprosternal sutures widely incomplete, not reaching anterior margin | Garrina Chamberlin* |
| 6b. Pleuroprosternal sutures complete, reaching anterior margin | Sogona Chamberlin* |

CATALOGUE OF SOGONID GENERA

The following names, not all of which belong there, have been referred to Sogonidae. An asterisk indicates I have seen material.

Andenophilus Verhoeff (? = Oryidae)

Andenophilus Verhoeff, 1942, Titschack's Fauna Perus, II, p. 62.

Type-species: *A. striatus* Verhoeff, 1942. Monobasic.

Remarks: Except for the mandible, Verhoeff has described a very typical oryid. Indeed, his species is otherwise so oryid that I can only believe him to have erred in describing the mandible. But apart from the question of what *Andenophilus* is, it is indubitably not a sogonid.

Chomatophilus Pocock*

Chomatophilus Pocock, 1896, Biol. Centr. Amer., Chilop., p. 39.

Nuevona Chamberlin, q.v. **New synonymy.**

Type-species: *C. smithi* Pocock, 1896. Monobasic.

Garrina Chamberlin*

Garrina Chamberlin, 1915, Bull. Mus. Comp. Zool. Harv. 59:506.

Pycnona Chamberlin, q.v. **New synonymy.**

Type-species: *G. ochra* Chamberlin, 1915. Original designation.

Gospina Chamberlin

Gospina Chamberlin, 1940, Pan.-Pac. Ent. 16:56.

Type-species: *G. bexara* Chamberlin, 1940. Original designation, monobasic.

Idiona Chamberlin (= *Arctogeophilus*, **new synonymy**)

Idiona Chamberlin, 1946, Can. Ent. 78:69.

Type-species: *I. shelfordi* Chamberlin, 1946. Original designation, monobasic.

Remarks: The genus can only be a junior synonym of the chilenophilid genus *Arctogeophilus*.

Nuevona Chamberlin (= *Chomatophilus*, **new synonymy**)

Nuevona Chamberlin, 1941, Pan.-Pac. Ent. 17:185.

Type-species: *N. leonensis* Chamberlin, 1941. Original designation and monobasic.

Oligna Chamberlin

Oligna Chamberlin, 1943, Univ. Utah Biol. Ser. 7:19.

Type-species: *O. pueblana* Chamberlin, 1943. Original designation and monobasic.

Remarks: I believe there is at least some reason for suspecting the genus to be a junior synonym of the dignathodontid *Pagotaenia* Chamberlin, but under the circumstances this cannot be proved without recourse to the types. Nonetheless, the reader is alerted to the possibility.

Portoriconna Chamberlin*

Portoriconna Chamberlin, 1950, Proc. Biol. Soc. Wash. 63:159.

Type-species: *P. adjunta* Chamberlin, 1950. Original designation.

Pycnona Chamberlin* (= *Garrina*, **new synonymy**)

Pycnona Chamberlin, 1943, Univ. Utah Biol. Ser. 7:18.

Type-species: *P. pujola* Chamberlin, 1943. Original designation.

Sogona Chamberlin*

Sogona Chamberlin, 1912, Bull. Mus. Comp. Zool. Harv. 54:431.

Type-species: *S. minima* Chamberlin, 1912. Original designation and monobasic.

Timpina Chamberlin

Timpina Chamberlin, 1912, Bull. Mus. Comp. Zool. Harv. 54:433.

Type-species: *T. texana* Chamberlin, 1912. Original designation and monobasic.